

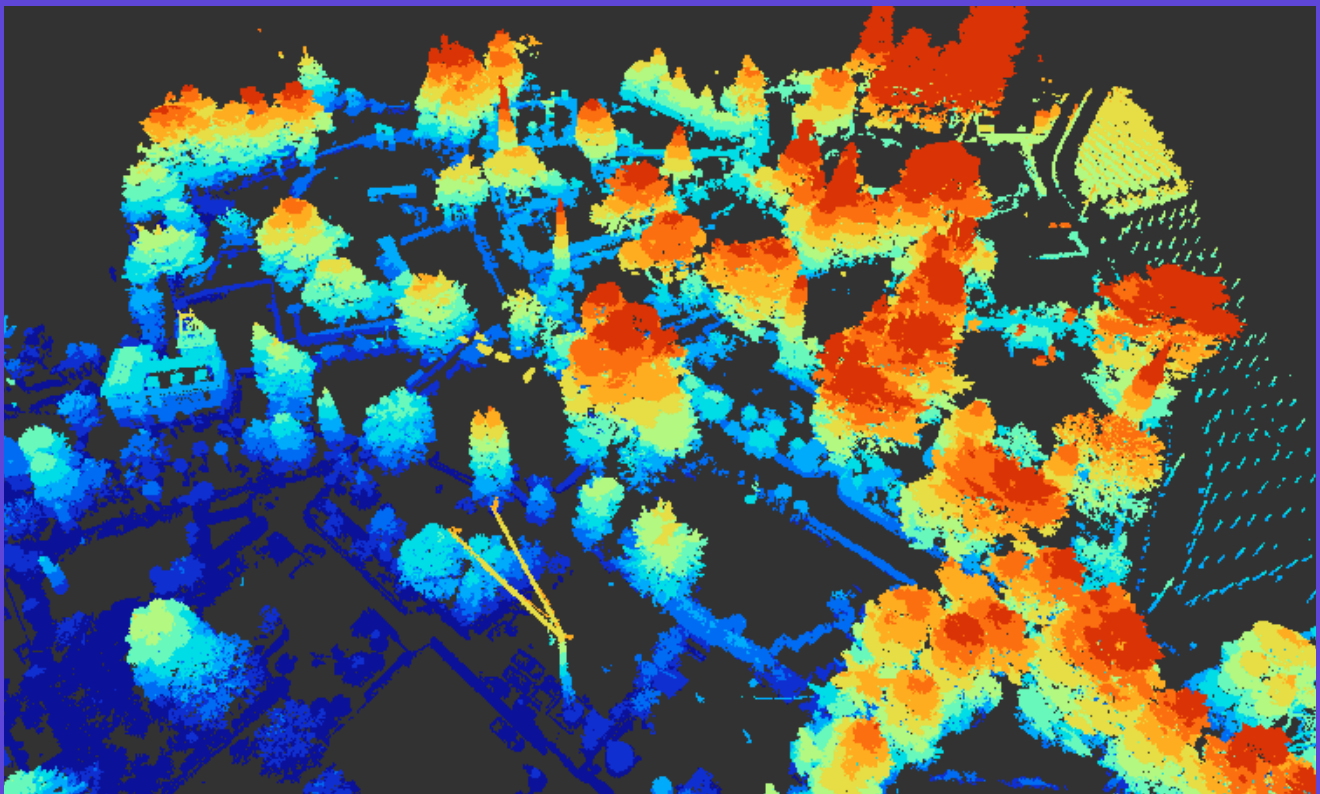


STADTGEMEINDE MERAN
COMUNE DI MERANO



JUS NATURE

GUIDELINES FOR THE IMPLEMENTATION OF ECOLOGICAL FUNCTIONALITY MEASURES IN THE DESIGN OF PRIVATE GREEN AREAS IN MERANO



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In collaboration with



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PURPOSE OF THE GUIDELINES
AND ADDRESSEES

Merano is one of the seven pilot sites of the JUSTNature project, funded by the European research and innovation programme Horizon 2020. The project, which runs from 2021 to 2026 and involves more than twenty partners across Europe, is testing different nature-based solutions (NbS) in these seven cities. They are developing and implementing design interventions and urban policies to become more environmentally sustainable by keeping carbon emissions low and air quality high, and to ensure access to quality green open spaces for all citizens.

In continuity with the “Handbook for green planning in Merano”, published in September 2023 and available on the Municipality’s website, this booklet aims to guide planners in the application of ecological functionality measures (a specific tool of the Municipal Building Regulations) in different design situations, and to spread the knowledge of this unique urban planning tool within the JUSTNature project network.



Overview of the cities involved in JUSTNature project
(fonte: <https://justnatureproject.eu/>)

MERANO GREEN CITY

Merano lays among the Alps and is enclosed by the Tessa mountain range and the wide basin of Adige river, which ensure an unusual mild climate in comparison with other Alpine locations. Thanks to these climatic conditions, starting from the second half of the 19th Century Merano established itself as a spa destination. Landscape promenades and large private gardens were created for therapeutic purposes and, later, for tourism. In Merano private green spaces cover a much larger area than public ones.

The predominance of private green areas as well as the urban morphology have created strong building pressure and a shortage of available areas for large public parks.

Nevertheless, the municipality has committed to enhancing existing public green spaces, promoting planning policies for greening private buildings and creating a network of pilot landscape

projects that are particularly attentive to ecological functionality and sustainable management practices (intended to also serve as an inspiration for private landowners).

The commitment of the city for sustainable development led to the achievement of the European Energy Award Gold in 2024 and the publication of the Merano Green Manifesto in June 2025, a multi-stakeholder engagement to integrate and preserve green as essential infrastructure in urban planning.

40% of the urbanized area in Merano consists of green spaces

80% of the green spaces are privately owned

Source: Green Plan of the city of Merano, 2022



MERANO GREEN CITY MANIFESTO

Urban greenery is neither a luxury nor a bargaining chip – it is key to supporting biodiversity, climate resilience, public health, and the well-being of all citizens.

Our city is committed to sustainable, future-oriented urban development that values and enhances green and built infrastructure equally. We are dedicated to protecting and strengthening the green heritage of our garden city: promenades, parks, tree-lined avenues, and private gardens form the backbone of our urban landscape and our quality of life.

We pledge to document, preserve, and further develop all green spaces – public and private, urban and agricultural.

We promote innovative solutions such as green roofs and façades, safeguard valuable trees and green areas, and advocate for biodiversity, including in agriculture.

High-quality greenery must be an integral part of urban planning – embedded in both public and private building projects.

Our citizens are active partners in this mission. Their participation and sense of responsibility are essential to its success.

III Merano Tree Days, June 2025



Credits: Omega Production



Credits: Omega Production

ECOLOGICAL
FUNCTIONALITY

Ecological functionality (e.f.) expresses the extent to which a given surface, structure or space is capable of favouring the conservation and enhancement of the biodiversity of the area in which it is located, acting as a habitat and/or source of nourishment for animal or plant species, mitigating the negative effects on these species deriving from human activities, facilitating their movement in the anthropic environment. Ecological Functionality Measures (EFM) are a specific tool of the Municipality of Merano which was introduced by the Building Regulations as of March 2019.

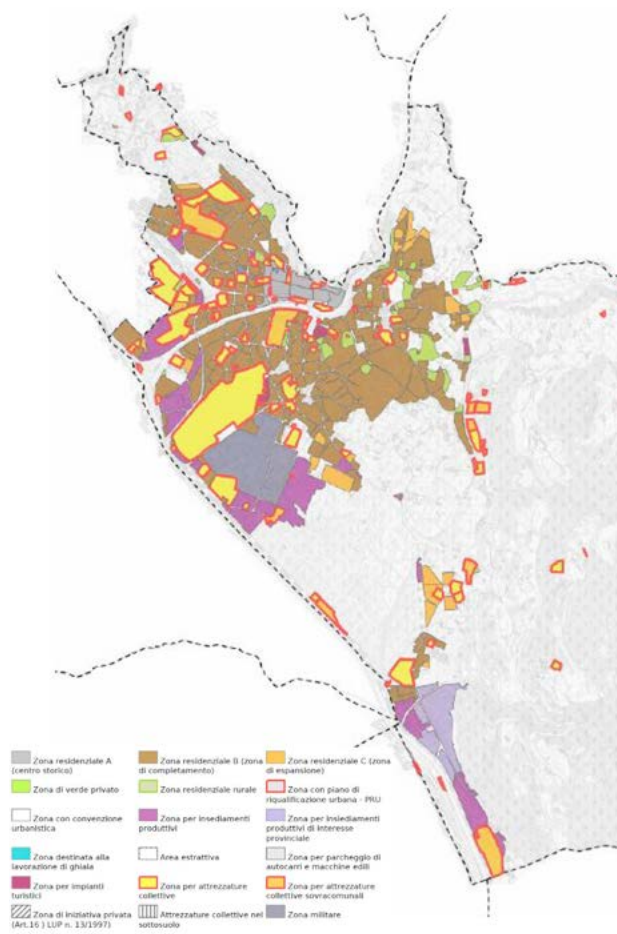
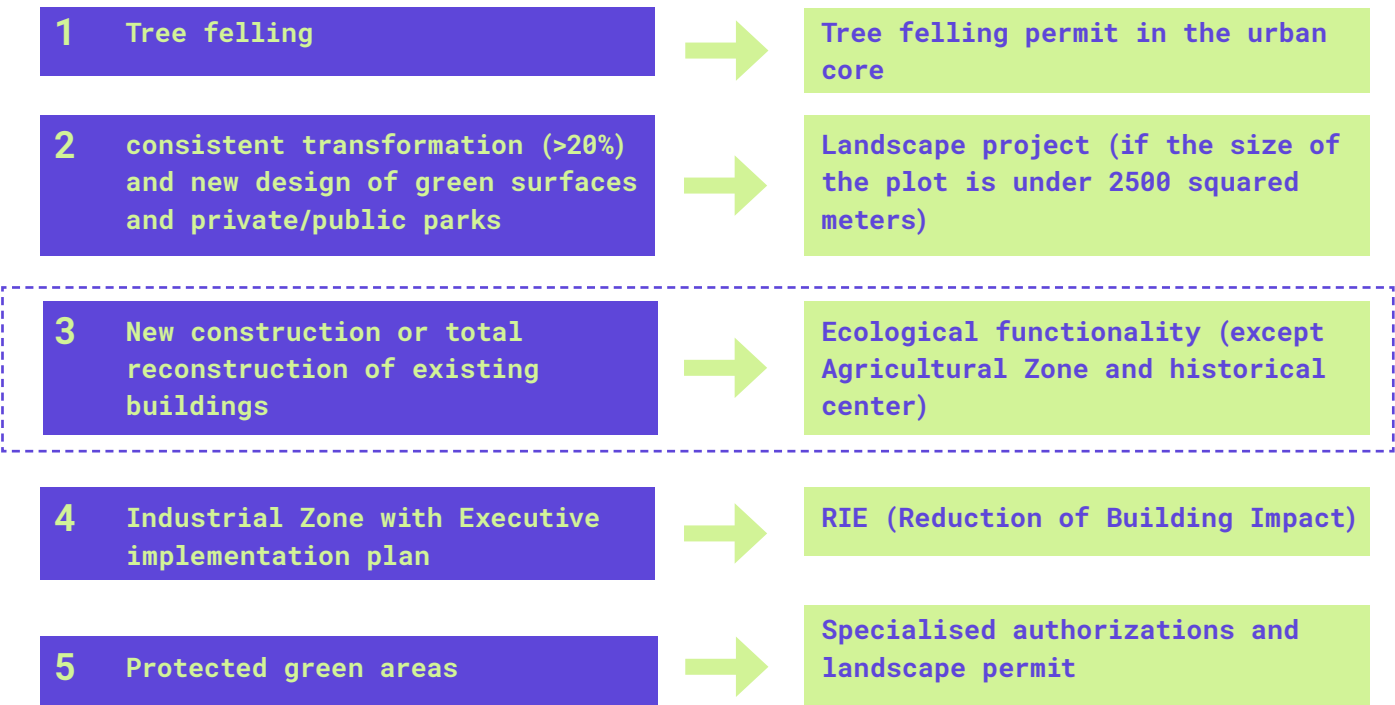
For interventions of new construction or total reconstruction, the project must guarantee the achievement of a given minimum score for ecological functionality, which differs according to the urban planning area of the land-use plan, through specific measures for the conservation and enhancement of flora and fauna. The Building Regulations list the main interventions that can be carried out for improving ecological functionality, indicating for each of them the minimum requirements and the associated unit score.

Although ecological functionality is a forward-looking approach to ensure the preservation and introduction of green spaces of ecological value in the city, it must be combined with context-sensitive design and the functional requirements of each project to ensure certain landscape quality. Ecological Functionality aims to ensure balanced urban development through the inclusion of compensatory measures of ecological-environmental value to preserve and promote urban biodiversity and, indirectly, the climate adaptation of buildings

and open spaces. However, in these first years of application of the measures, the following challenges are encountered:

- Balance between private economic interests and urban green heritage, often of considerable historical-monumental and scenery value;
- Lack of design approaches that ensure high quality landscape amenities as well as effective ecological functionality;
- Aesthetic-compositional relationship with the historical green of the Merano area.

Intervention variables for building projects with transformation of green spaces and subsequent application for housing permits in the Municipality of Merano



Urban planning zone as defined in the Municipal Land-use Plan	Minimum green surface	Minimum e.f. score
RESIDENTIAL ZONE B7	15%	45
RESIDENTIAL ZONE B1, C1	25%	70
RESIDENTIAL ZONE B2, B8, C2, C3, C4	30%	80
RESIDENTIAL ZONE B3, C5	35%	90
RESIDENTIAL ZONE B4, C7, C8	40%	105
RESIDENTIAL ZONE B5, B6, C6	50%	140
INDUSTRIAL ZONE	10%	55
ZONE FOR PUBLIC FACILITIES	30%	80
ZONE FOR TOURIST FACILITIES AND CAMPING	90%	140
ZONE FOR TOURIST ACCOMODATION FACILITIES	50%	140

Map of urban planning zones as defined in the municipal land use plan (PUC) and table of the minimum scores to achieve the ecological functionality approval (see Table 2 in Annex 6 of the Building Regulations)

	ECOLOGICAL FUNCTIONALITY MEASURES	Assigned score for Ecological Functionality
1	HEDGES AND SHRUBS WITH HIGH STRUCTURAL AND DESIGN ARTICULATION	8 points
		for each % point of building plot deployed
2	SINGLE-SPECIES HEDGES AND SHRUBS	1,5 points
		for each % point of building plot deployed
3	LAWN AND FLOWER BEDS WITH PERENNIAL SPECIES	0,75 points
		for each % point of building plot deployed
4	GREEN ROOFS WITH HIGH BIODIVERSITY	2,5 points
		for each % point of building plot deployed
5a	ORDINARY GREEN ROOFS	0,75 points
		for each % point of building plot deployed
5b	SOLAR GREEN ROOFS	2,5 points
		for each % point of building plot deployed
6	MULTI-SPECIES GREEN PERGOLAS	0,5 points
		for each % point of building plot deployed
7	GREEN WALLS	1,5 points
		for each % point of building plot deployed
8	TREES WITH DIAMETER > 30 CM I and II size class III size class	
		5 points for each tree
		4 points for each tree
9	TREES WITH DIAMETER < 30 CM I and II size class III size class	
		2 points for each tree
		1 point for each tree
10	WATERBODIES WITH RIPARIAN AND AQUATIC VEGETATION	8 points
		for each % point of building plot deployed
11	BIRD NEST HOUSES AND BAT BOXES ON BUILDINGS	2 points for each box
		(at least 3 boxes)
12	GREEN PERMEABLE PAVERS, STONEBLOCKS OR OTHER MODULAR TILES	0,25 points
		for each % point of building plot deployed

List of the Ecological Functionality Measures and their scores
(see Table 2 in Annex 6 of the Building Regulations)

Calculation method

I

What score must the project achieve in order to obtain approval?

–

Minimum score for the urban planning area of the project parcel as indicated in the municipal land-use plan

II

How to quantify each element?

–

Calculate the area occupied by each measure or the number of units (e.g. trees)

III

How much do the designed measures contribute?

–

Check the assigned points for each measure and multiply them by the % area of the building parcel occupied by the measure

Application example

The project area falls within the ‘B3 residential area’ >> a minimum ecological functionality score (f.e.) of **90 points must be achieved**

>

Measure 1

HEDGE WITH HIGH STRUCTURAL AND COMPOSITIONAL ARTICULATION



e.f. score: 8 pts
total area: 60 square metres

>

Total plot area: 1000 square metres
% covered by Measure 1: 6%

Contribution of Measure 1
6*8 = 48 pt

**GUIDELINES
TO THE
APPLICATION OF
THE ECOLOGICAL
FUNCTIONALITY
MEASURES**

SINGLE-SPECIES HEDGES AND SHRUBS

What is meant by

Simple hedges and shrubs are made up of only one or two plant species. Hedges are often used as borders because they grow quickly, take up little space (as little as 60–80 cm wide), and are easy to design, plant, and maintain—no expert help needed. Since they usually use evergreen plants and are pruned often, hedges tend to look the same all year, with little color variety or visible flowers. In contrast, small shrub patches (not used as barriers) can include deciduous plants that change color with the seasons and offer attractive flowers if left unpruned.

Ecological value

Because of the low variety of plants and frequent pruning, these hedges offer little support for insects and birds (few flowers, fruits, or nesting spots). However, if they grow close to the ground, they can still help small animals move and hide. They can also reduce noise and air pollution to some extent.

Design recommendations

Designing these green elements is usually simple—mainly focused on choosing plants suited to the local soil and climate. For hedges, evergreen species are preferred, especially those that handle regular pruning and tight spacing. If the hedge is meant to help with air pollution, plant choice becomes more important, as different species filter pollutants differently.

Landscape quality

Simple hedges provide relatively uniform foliage colouring over the course of the year, almost always no flowering (most often prevented by pruning) and little colour variability. They are characterized by fast implementation, with the possibility of achieving a good masking/shading effect in a short time (even on considerable heights).

Maintenance instructions

- frequent maintenance (usually annual pruning)
- easy maintenance (i.e. not requiring specialised personnel)

Minimum requirements to fullfill the ecological functionality

- Surface area of not less than 2 square metres, with a minimum width of 0.7 m



Suggested species*



Berberis vulgaris



Euonymus europaeus



Ligustrum vulgare

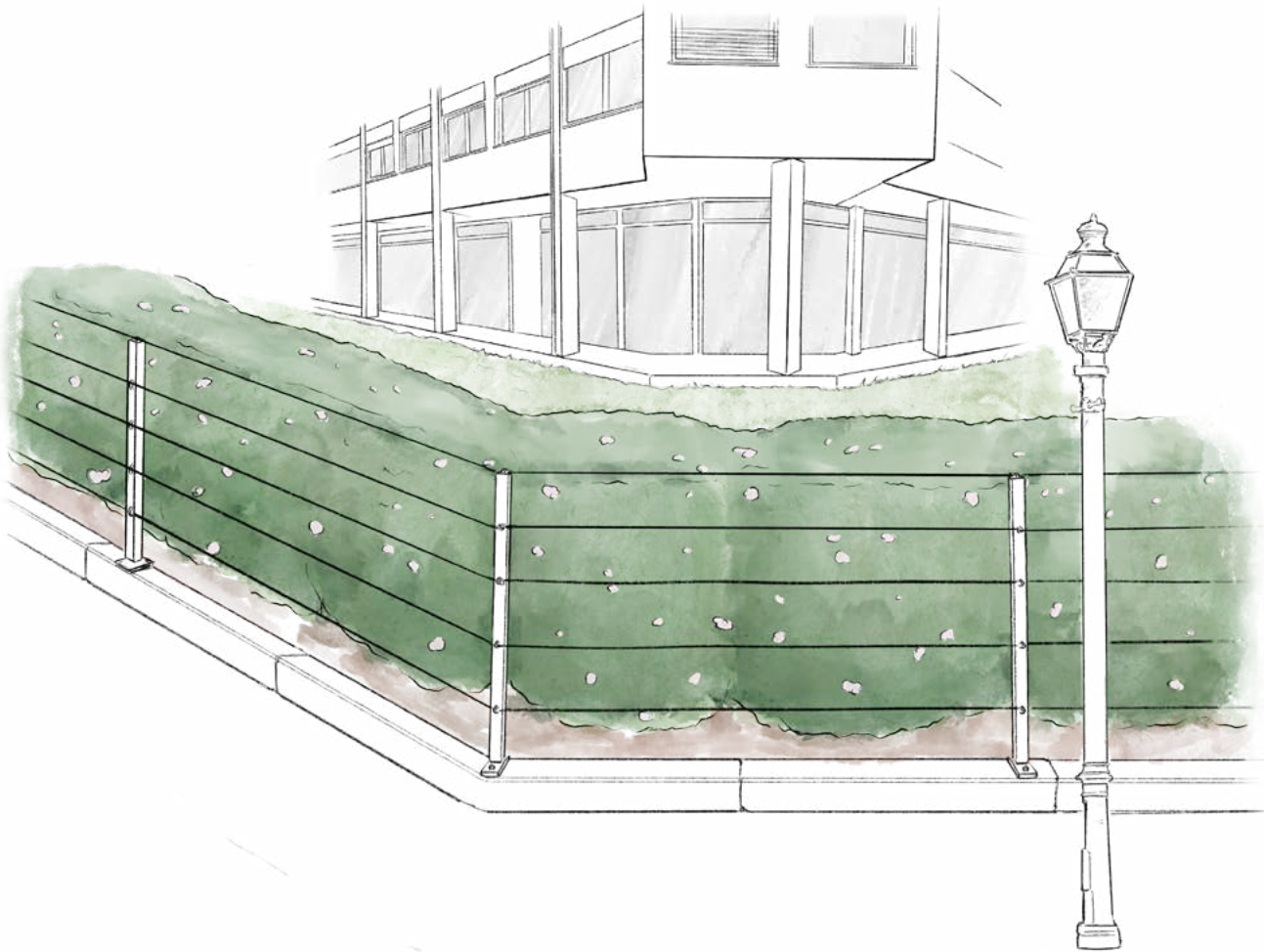


Taxus baccata



Cytisus scoparius

*Suggested selection to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



HEDGES AND SHRUBS WITH HIGH STRUCTURAL AND DESIGN ARTICULATION

What is meant by

These hedges and shrub areas include many different plant species (6 or more). They are usually wider (over 1.3 meters) and take more time and care to plan and grow. Unlike simple hedges, they offer greater visual appeal through varied shapes, colorful foliage, seasonal changes, flowers, and fruits. However, they don't follow the neat, geometric look of single-species hedges.

Ecological value

Well-designed multi-species hedges are excellent for wildlife. They provide food (like nectar, pollen, and fruit) and shelter for many animals throughout the year. Like all hedges, they can also help reduce noise and air pollution.

Design recommendations

Because of their complexity, these hedges should be designed by professionals. Plant choices should support wildlife by offering food across seasons. Low-growing shrubs at the edges help ground-dwelling animals (like hedgehogs or snails) find shelter. Plants should also be spaced and placed carefully to avoid overcrowding and to ensure healthy growth.

Landscape quality

Complex hedges offer high aesthetic attractiveness, due to the variety of shapes and colouration of the foliage, flowering and fruiting, and their variability throughout the year. They require relatively long time for their complete establishment.

Maintenance instructions

- maintenance with multi-annual pruning (every 3-4 years)
- maintenance to be entrusted to experienced personnel, who are able to use different pruning techniques according to the specific needs of the species, to ensure that the mixed composition of the hedge is preserved over time

Minimum requirements to fulfill the ecological functionality

- **at least 6 different shrub species, in similar proportions;**
- **at least 75 per cent of the species must be autochthonous to the territory of the province of Bolzano, but excluding varieties and cultivars (plants selected and cultivated in nurseries, which do not occur naturally);**
- **species of interest to pollinating insects, birds and mammals;**
- **arrangement of the species in such a way as to ensure that the structural articulation is as high as possible and that the outer edges are dressed down to the ground;**
- **surface area of not less than 3 square metres, with a minimum width of 1.3 metres.**

Suggested species*



Euonymus europaeus



Cornus spp



Corylus avellana



Juniperus communis



Lonicera nigra

*Suggested selection to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



LAWN AND FLOWER BEDS WITH PERENNIAL SPECIES

What is meant by

A lawn is any area covered with low-growing plants. It can range from a simple “English lawn” made of just a few grass species to more natural “flower meadows” with many types of plants and colorful blooms.

Ecological value

Lawns with more plant variety, especially flower meadows, support insects like bees and butterflies by providing nectar, pollen, and shelter. The less often they’re mowed, and the more species they include, the better they are for biodiversity. Flower beds with a mix of spring, summer, and autumn blooms also offer food for pollinators throughout the year.

Design recommendations

Before creating a lawn, it’s important to decide how it will be used. If it’s for walking, playing, or pets, a durable, low-diversity grass lawn is best. These need frequent mowing and watering. If the area is mostly undisturbed, a flowering or species-rich meadow can be created, which needs little care—just one or two cuts a year and no irrigation. Other important factors include soil type, sunlight, shade, and how much maintenance you’re willing to do. Uniform lawns give a neat look, while species-rich meadows create a more natural, colorful, and informal appearance.

Landscape quality

The choice of the type of turf also depends on other factors, both in terms of management effort and aesthetic appeal. Flower beds with perennial species certainly have an impactful landscape value due to the variety of blooms and patches of colour

Maintenance instructions

- depending on the type of lawn/bed chosen, different levels of maintenance are required: the so-called English lawn requires frequent mowing and continuous watering, while flowerbeds can be treated with alternating mowing or even just one/two treatments per year after flowering is complete;
- flower beds require frequent maintenance if a tidy, full effect is desired, but can be created without irrigation

Minimum requirements to fullfill the ecological functionality

- continuous herbaceous topsoil and overall covering at least 90% of the area counted. Interruptions may be given by paths crossing the total area that do not alter its nature;
- flower beds of herbaceous/ arbustive perennial species, with planting density such that there is continuous contact between the plants.
- areas of not less than 2 square metres, with a minimum width of 1 metre.

Suggested species*



Alchemilla millefolium



Campanula rotundifolia



Knautia arvensis



Leucanthemum vulgare



Salvia pratensis

*Suggested selection for a flower meadow with soil poor in nutrients and in sunny location to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



GREEN ROOFS WITH HIGH BIODIVERSITY

What is meant by

These green roofs are designed to support a wide variety of wildlife. They include many types of plants—grasses, flowers, shrubs, and even small trees—along with natural features like logs, rocks, sand piles, small ponds, and artificial nests. These elements create habitats for insects, birds, and other animals.

Visually, biodiverse roofs can look more wild and less orderly than regular green roofs, but they are often rich in colors and textures. Their look depends on how the plants and features are arranged during design.

Ecological value

Biodiverse green roofs are great for wildlife, offering food (like nectar, pollen, and fruit) and shelter. In cities, they serve as “stepping stones” that help animals move between green spaces. Like all green roofs, they also help reduce heat, noise, air pollution, and improve rainwater management. Plus, they improve building insulation, helping save energy.

Design recommendations

Designing a biodiverse roof requires both technical and ecological knowledge. Plant species should support wildlife and be arranged to grow well together without competing. Extra features like logs or water areas must be placed thoughtfully to be effective. The design must also follow building standards (such as UNI 11235) to ensure safety and durability.

Landscape quality

Biodiverse green roofs have a significantly greater aesthetic appeal compared to non-green roofs, and compared to ordinary green roofs due to the richness of foliage and flowering colours. They guarantee a certain speed of implementation (although less than for ordinary green roofs).

Maintenance instructions

- maintenance to be entrusted to experienced personnel, able to ensure the long-term preservation of the high variety of plant species used, as well as trained in safety aspects

Minimum requirements to fullfill the ecological functionality

- **thickness of the cultivation layer (substrate) varying between 12 and 25 cm for extensive green roofs, and > 25 cm for intensive ones;**
- **modelling of the substrate in areas of different thickness (at least 3 different thickness classes);**
- **diversification of the floristic composition in terms of number of species (at least 25-20 different species), structural characteristics and flowering period;**
- **addition of additional structures that increase the ecological value of the roof**
- **compliance with the criteria laid down in UNI 11235 as amended.**

Suggested species*



Sedum sexangulare



Saponaria ocymoides



Pulsatilla vulgaris

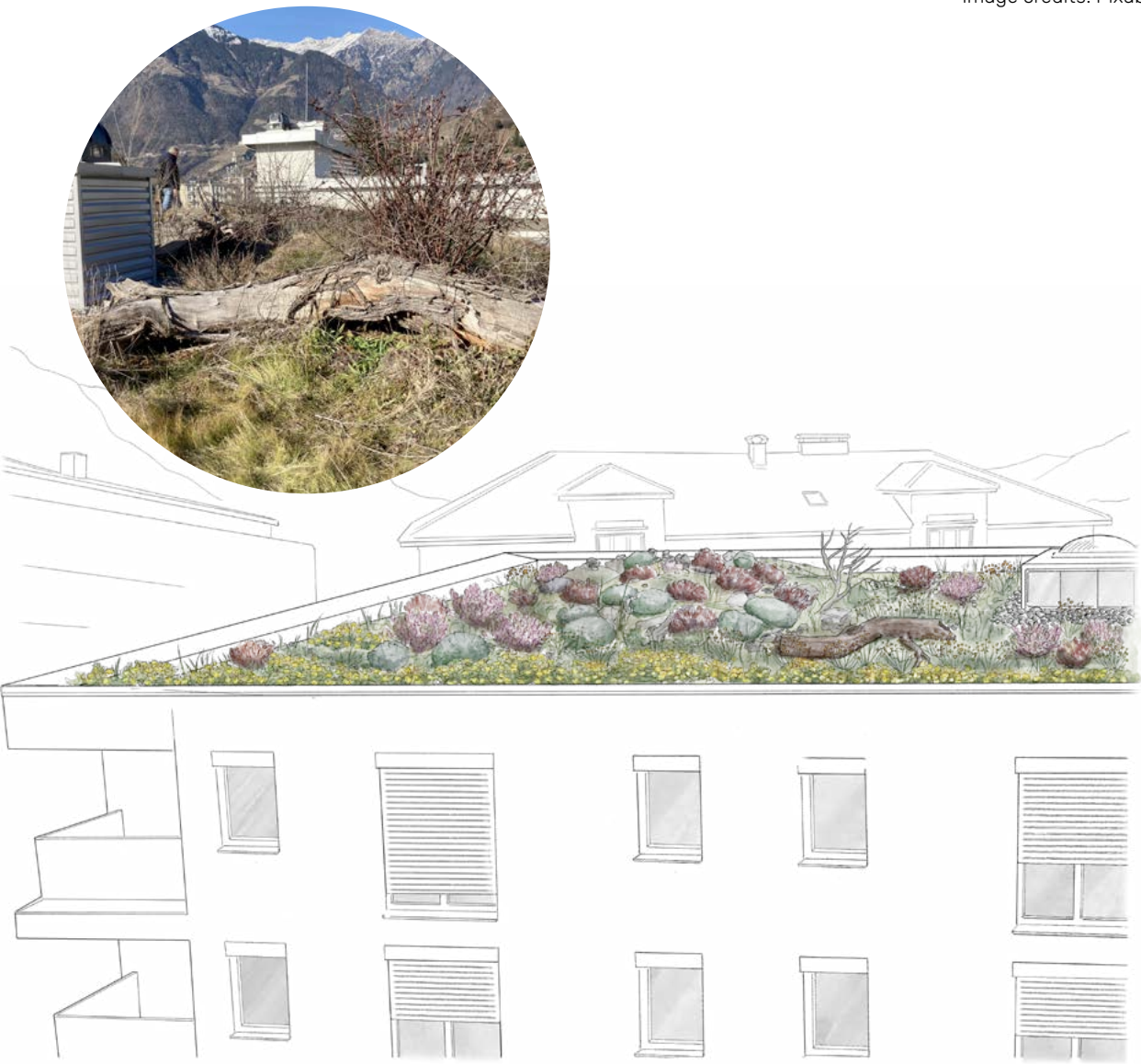


Allium sphaerocephalon/vineale



Petrorhagia saxifraga

*Suggested selection to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



ORDINARY GREEN ROOFS

What is meant by

Ordinary green roofs are standard extensive or intensive roofs that don't include special features for wildlife. They typically have fewer plant species, a uniform soil layer, and no added natural structures like logs or birdhouses. A common example is an extensive green roof with a thin soil layer (8–15 cm) and hardy plants like Sedum, known for their ability to handle heat and drought. These roofs improve the look of buildings, though with less variety in color and shape than biodiverse roofs.

Ecological value

While less supportive of wildlife than biodiverse roofs, ordinary green roofs can still attract insects and some other small creatures. They also help reduce urban problems like overheating, stormwater runoff, and air pollution.

Design recommendations

The technical design follows similar rules to those for biodiverse roofs. However, plant choices are simpler and no special wildlife-supporting features are included, making them easier to plan and maintain.

Landscape quality

Green roofs have a significantly greater aesthetic appeal compared to non-green roofs. They ensure speed of construction, especially for extensive green roofs.

Maintenance instructions

- annual maintenance requirements (in the case of extensive green roofs limited to the removal of weed species and eventual compensation of failures)
- ease of maintenance, especially in the case of extensive green roofs

Minimum requirements to fulfill the ecological functionality

- The only requirement is compliance with the construction criteria laid down in UNI 11235 and subsequent amendments and, of course, a continuous and permanent green covering of the computed surface.



Credits: CC BY-SA 2.0

Suggested species*



Sedum floriferum



Sedum album



Sedum reflexum



Sedum hybridum



Helictotrichon sempervirens

*Suggested selection to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



SOLAR GREEN ROOFS

What is meant by

This type of roof combines plants with solar panels. The greenery helps keep the roof cool, which improves the panels’ energy efficiency. It also softens the visual impact of the solar system.

Ecological value

The more plant species used, the more the roof supports insects and other small wildlife. Like other green roofs, it also helps reduce heat, slow down rainwater runoff, and clean the air. Solar panels provide clean energy, adding further environmental benefits.

Design recommendations

Designing these roofs is more complex. The layout must allow plants to get enough sunlight and water, while also avoiding shade on the solar panels to keep them working efficiently.



Credits: Deutsches Ingenieurblatt

Landscape quality

The landscape impact of this typology is determined by the presence of solar panels, which can be partially mitigated by green roof vegetation.

Maintenance instructions

- the maintenance of this type is similar to that of ordinary green roofs, plus the additional expertise required to maintain the photovoltaic system

Minimum requirements to fulfill the ecological functionality

- compliance with the construction criteria laid down in UNI 11235 as amended;
- green area covering at least 50 per cent of the usable area (flat roof).

Suggested species*



Sedum floriferum/album/reflexum



Saponaria ocymoides



Iris pumila



Hieracium pilosella



Gypsophila repens

*Suggested selection to be validated by a landscape practitioner based on the intervention context. Source: Laimburg
Image credits: Pixabay



TREES OF I-II-III SIZE CLASS

What is meant by

Trees are often grouped by their height when fully grown:

- First size: over 25 meters tall
- Second size: 15–25 meters
- Third size: under 15 meters, but only if they have a clear tree shape (a main trunk with a defined crown above)

Ecological value

Trees provide many benefits in cities. They clean the air, cool the surroundings, slow rainwater runoff, and support wildlife by offering food and shelter. Bigger and older trees are especially valuable because they develop special habitats (called dendromicrohabitats)—like cavities, dead wood, or bark cracks—that support many species, including insects, birds, fungi, and lichens.

Design recommendations

Planting a tree is a long-term investment, so the species must be chosen carefully. It's important to consider:

- The space it will need both above and below ground
- Its final size and shape
- Soil quality and sunlight
- Legal distances from property lines and buildings (usually 1.5–3 m from property boundaries, and 2 m from buildings)

Also consider features like leaf drop, flowering, fruits, seasonal color, and whether the tree might cause allergies or other issues. Choosing the right tree helps meet both environmental and aesthetic goals.

Minimum requirements to fulfill the ecological functionality

- only trees that are in good phytosanitary and static condition are to be taken into account in the calculation of the ecological functionality;
- For newly planted trees, sufficient epigeal (above the soil surface) and hypogean (below the surface) space must be ensured for optimal crown and root system development.



WATERBODIES WITH RIPARIAN AND AQUATIC VEGETATION

What is meant by

These are small, artificial ponds filled with many plants around the edges and inside the water. They are not meant for swimming but add beauty to gardens.

Ecological value

A well-designed pond supports lots of wildlife, including insects like dragonflies and water beetles, and sometimes frogs, toads, and newts. The plants and animals create a balanced environment that also helps control mosquitoes by feeding their larvae. Plants filter and oxygenate the water, keeping it healthy and clear.

Design reccomendations

Ponds should be at least 60 cm deep to keep water cool in summer and prevent freezing in winter. They need the right balance of sun and shade—too much sun can cause algae and low oxygen, while too much shade can stop plants from growing. Different depths in the pond help different plants and animals thrive. Gentle slopes on the banks make it easy for animals to enter and leave and give plants a place to grow.

Landscape quality

Wet environments constitute a picturesque element in parks and gardens and represent several symbols, such as regeneration, quietness, life. The design of the edges is essential to enframe and create reflections on water.

Maintenance instructions

- the maintenance of water bodies must be assigned to specialised personnel;
- a good maintenance is not necessarily demanding, rather it must ensure the natural balance of water ecosystems to avoid undesired insects and smells.

Minimum requirements to fullfill the ecological functionality

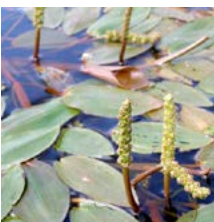
- minimum size: 15 m2;
- water depth for at least 30% of the body of water not less than 60 cm;
- planting of at least 8 different species of hygrophilous bank vegetation, emerged aquatic, submerged aquatic.



Suggested species*



Nymphaea spp.



Potamogeton natans



Caltha palustris

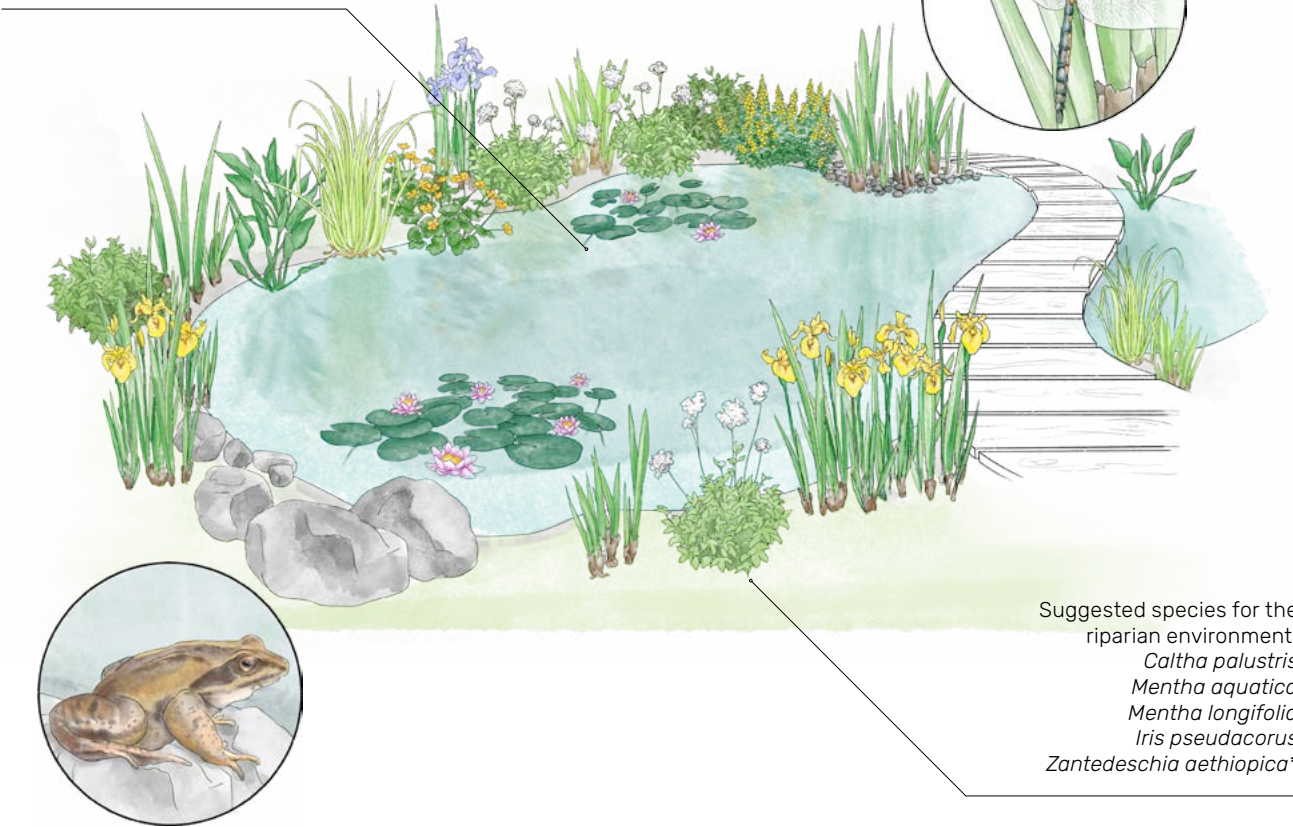


Mentha longifolia



Iris pseudacorus

Suggested species for the aquatic environment:
Nymphaea spp.
Nuphar lutea
Lemnaceae Martinov
*Potamogeton natans**



*Suggested selection to be validated by a landscape practitioner based on the intervention context.
Source: Mauro Tomasi

MULTI-SPECIES GREEN PERGOLAS

What is meant by

These are structures like pergolas or arches covered by climbing plants that grow from the ground up. They can also be used over car parks, ramps, or trash areas to improve the look of the space.

Ecological value

Climbing plants provide food like pollen, nectar, and fruit for many insects and animals. Some butterflies lay eggs on these plants, supporting their life cycle. These green coverings also offer shade, helping to cool the area and reduce heat. They slow down rainwater runoff and help clean the air by trapping pollutants on their leaves.

Design recommendations

When picking climbing plants, consider the location, how they grow, and how big and heavy they get. Different climbing styles and growth speeds need space to avoid crowding each other. Also, make sure the plants won't damage the structure they grow on.

Landscape quality

Green pergolas are key elements in gardens as well as around buildings because they provide shade and shelter from rain, wind, and noise. They can significantly contribute to the control of temperatures in summer due to their shading effect and the evapotranspiration of leaves.

Maintenance instructions

- pergolas require a low maintenance;
- climbing plants must be tied to a support in their early stage, and contained with targeted pruning when they grow too much in later stages.

Minimum requirements to fullfill the ecological functionality

- the pergola must be designed to achieve dense and complete plant cover on at least 75% of the structure within 3 years of planting;
- at least three plant species of interest to pollinating insects (pollinators) must be used.



Suggested species*



Lonicera caprifolium



Vitis vinifera



Bignonia capensis



Rosa spp (climbing)



Wisteria spp

*Suggested selection to be validated by a landscape practitioner based on the intervention context.
Image credits: Pixabay



GREEN WALLS

What is meant by

Green walls are plants that cover vertical surfaces like building façades, fences, or garage ramps. They can grow from the ground up or use special modular systems fixed to the wall. Green walls make buildings look nicer and are great when there isn't much space for plants on the ground. Both types need regular care, but ground-rooted plants usually need less maintenance than modular systems.

Ecological value

Green walls help cool the air and buildings by shading and releasing moisture. They slow down rainwater runoff and reduce air and noise pollution. They also provide homes for birds, insects, spiders, and other small animals, depending on how dense and diverse the plants are.

Design recommendations

For green walls with climbing plants, it's important to pick species that climb well without damaging the wall, and that don't crowd each other out. These plants need supports to climb. Modular green walls are more expensive and need automatic watering and feeding systems but create a green look right away. Sometimes plants can hang down from containers placed higher up on a building, creating "descending" green walls.

Landscape quality

Green walls have a greater aesthetic appeal compared to bare walls. They require a relatively long time to achieve the desired coverage.

Maintenance instructions

- in the case of green walls with climbing plants, the design must include appropriate supports for the plants, and care must be taken that the different species used (at least 3) do not compete excessively with each other;
- green walls built with above-ground modular systems are more complicated to design and more expensive (they require, for example, an automatic fertilisation and irrigation system), but they produce the desired green effect more quickly.

Minimum requirements to fullfill the ecological functionality

- the green wall must be designed to achieve a dense and complete vegetation cover on at least 75% of the structure within 3 years of planting;
- at least three different plant species of interest to pollinating insects (pollinators) must be used.



Hedera spp



Hydrangea petiolaris



Clematis vitalba

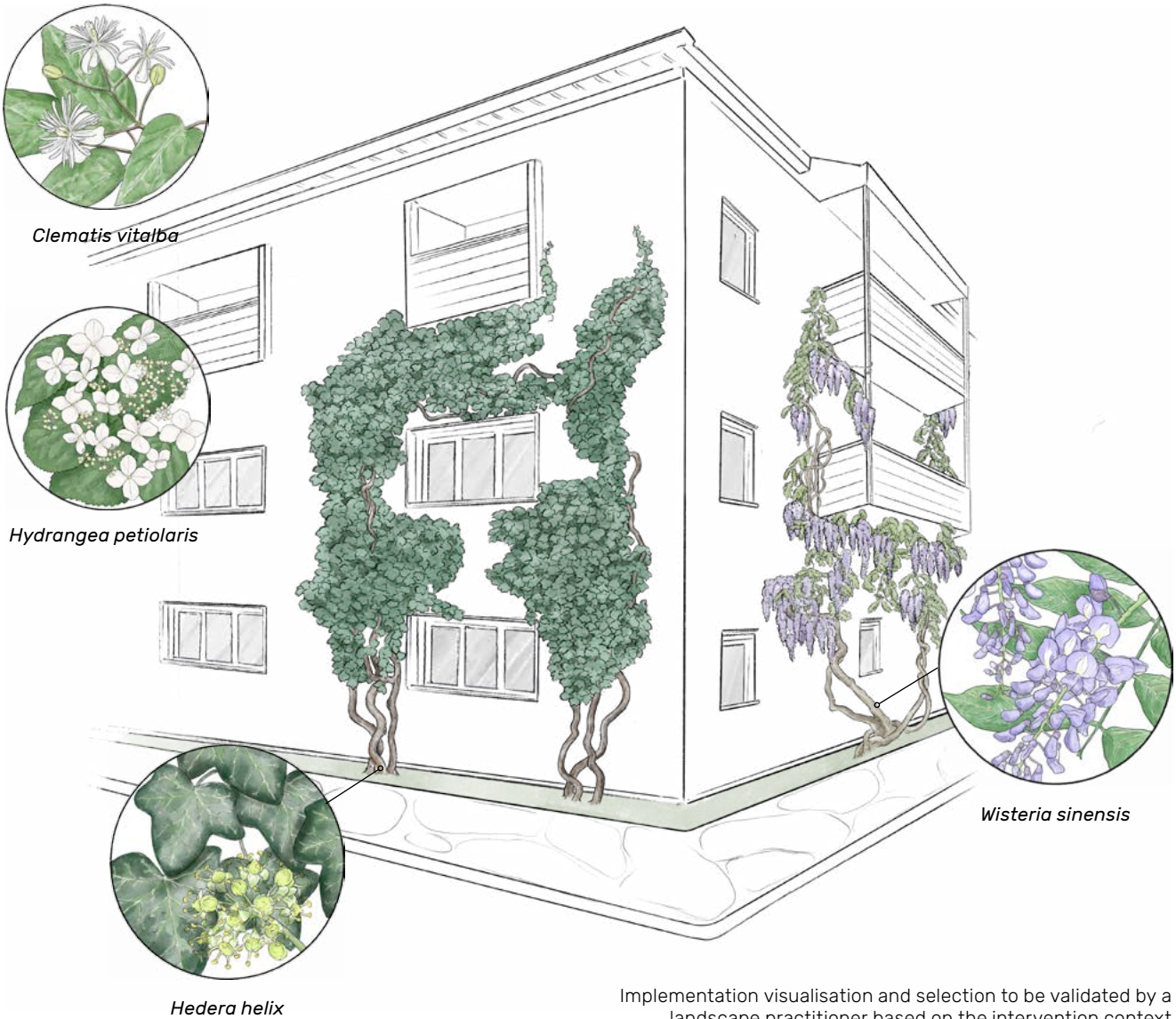


Parthenocissus spp



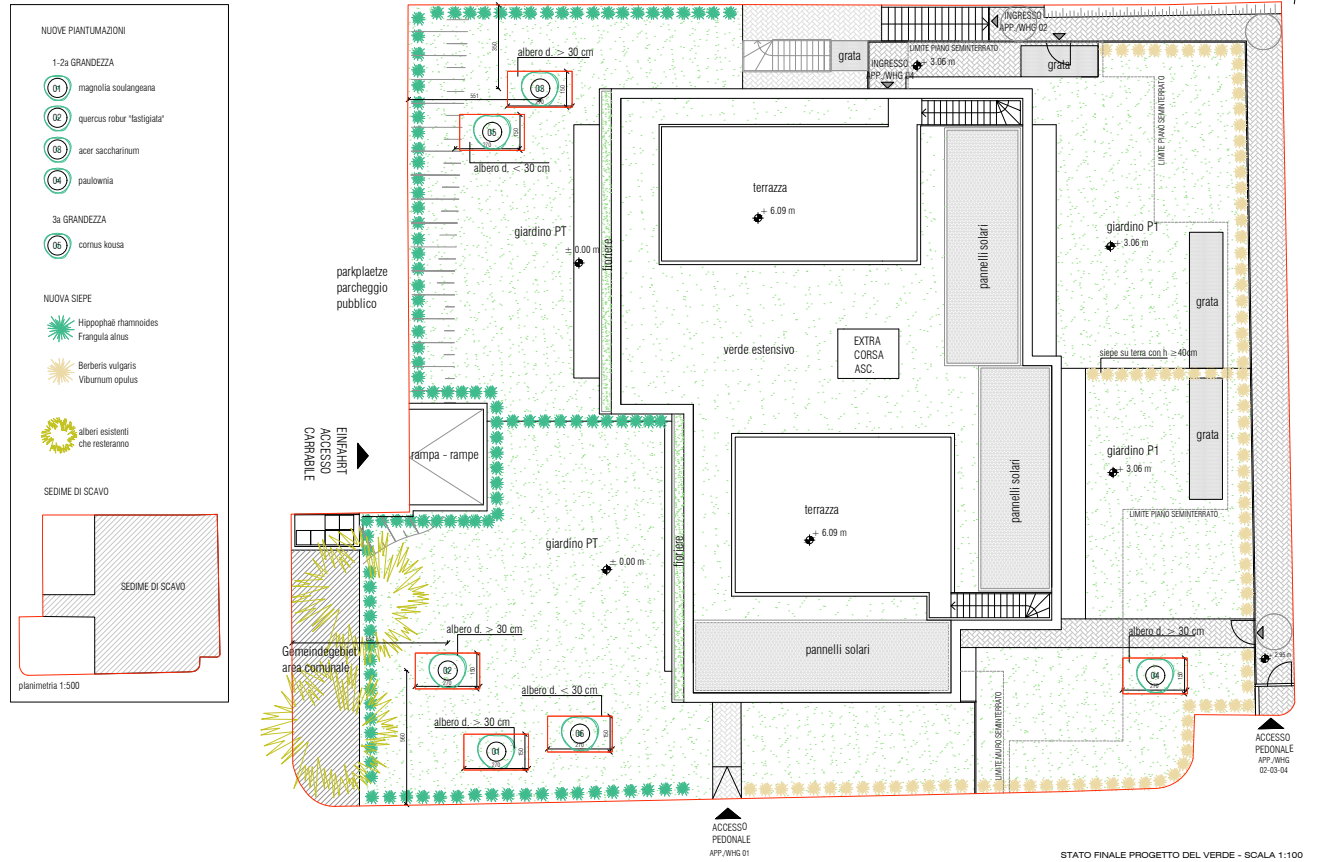
Wisteria spp

*Suggested selection to be validated by a landscape practitioner based on the intervention context.
Source: Mauro Tomasi
Image credits: Pixabay



Implementation visualisation and selection to be validated by a landscape practitioner based on the intervention context

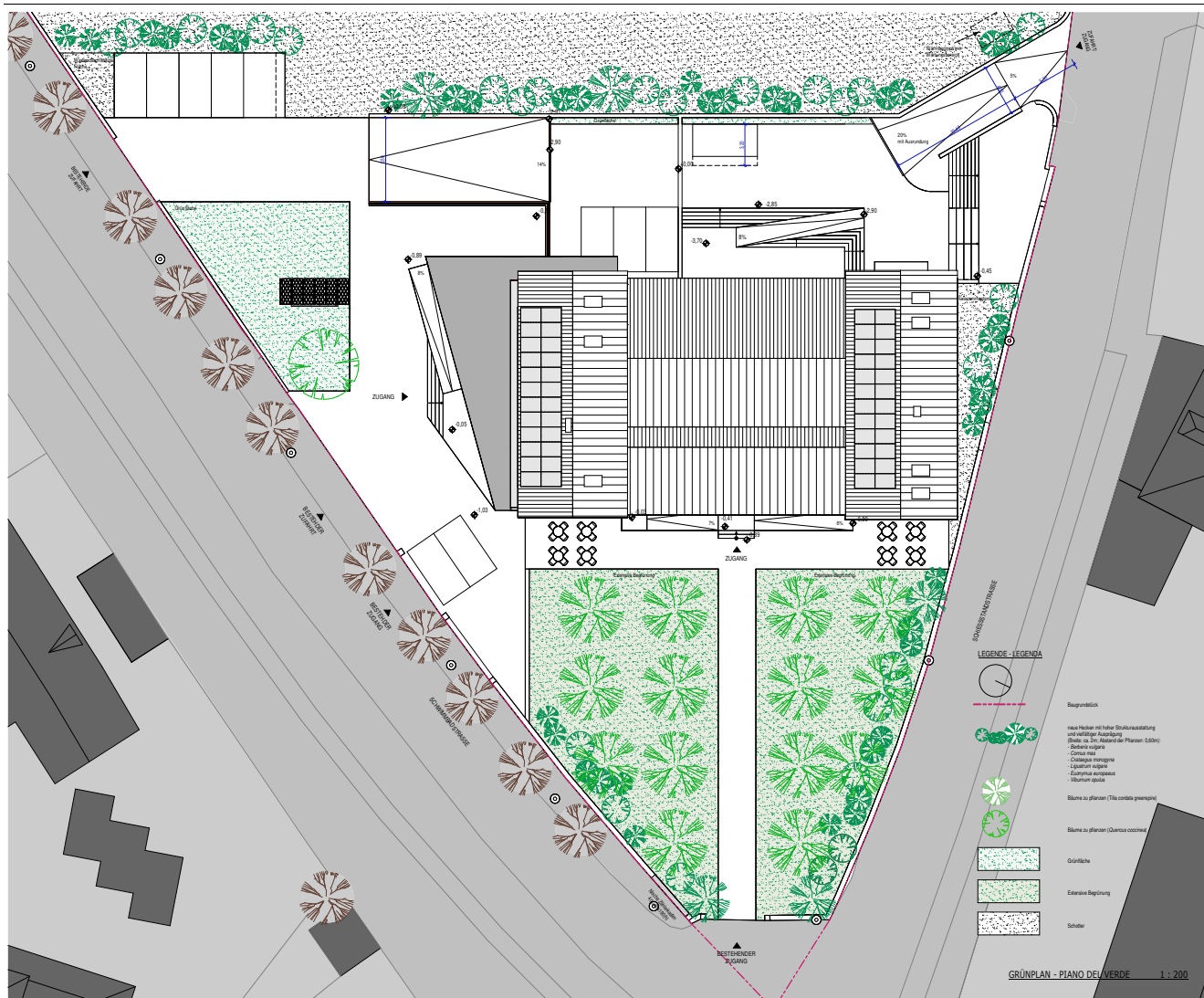
CASE STUDY: SMALL SCALE RESIDENTIAL PROJECT



FUNZIONALITA ECOLOGICA		valore	unita	1291 mq	k.	F.E.
1.	Siepe ad elevata articolazione	130,21	mq	10,09%	8	80,69
3.	Tappeto erboso e aiuole fiorite	541,21	mq	41,92%	0,75	31,44
5.	Tetto verde ordinario	145,21	mq	11,25%	0,75	8,44
5.	Verde intensivo	10,13	mq	0,78%	0,75	0,59
12.	Pavimentazione parzialmente inerbita	101,44	mq	7,86%	0,25	1,96
8.1	Alberi d. > 30cm 1 e 2 grandezza	1	pz.	Pauwlonia	5	5,00
8.1	Alberi d. > 30cm 1 e 2 grandezza	1	pz.	Quercus robur fastigiata	5	5,00
8.1	Alberi d. > 30cm 1 e 2 grandezza	1	pz.	Acer saccharinum	5	5,00
8.2	Alberi d. > 30cm 3 grandezza	1	pz.	Magnolia soulangeana	4	4,00
9.1	Alberi d. < 30cm 1 e 2 grandezza					
9.2	Alberi d. < 30cm 3 grandezza	2	pz.	Kornus Kousa	1	2,00
FUNZIONALITA' ECOLOGICA DI PROGETTO						144,12
FUNZIONALITA' MINIMALE RICHIESTA - B6						140,00



CASE STUDY: PROJECT FOR
COMMERCIAL/TERTIARY USE



Maßnahmen zugunsten der ökologischen Funktionsfähigkeit:

Zone für öffentlicher Einrichtungen: minimale öF 80

vom Umbau betroffener Bereich:

$$28,08 \cdot 40,94/2 + (33,60+51,35) \cdot 13,22/2 + (51,35+69,21) \cdot 16,05/2 + (69,21+62,27) \cdot 4,35/2 + (62,27+54,62) \cdot 3,31/2 + (54,62+42,60) \cdot 4,27/2 + 42,60 \cdot 10,89/2 + (52,32+51,40) \cdot 7,35/2 = 574,80+561,52+967,49+285,97+193,45+207,56+231,96+381,17 = 3403,93 \text{ m}^2$$

Hecken und Gebüsch mit höher Strukturausstattung und vielfältiger Ausprägung:



Breite: 2,00m
Länge: $18,13+40,68+2,42+5,78+9,5+20,43+3,78+27,30 = 128,02 \text{ m}$
Breite: 2,00m
Fläche: $128,02 \cdot 2 = 256,04 \text{ m}^2 = 7,5 \% \text{ der Fläche vom Umbau betroffen}$
Punkte: $7,5 \cdot 8 = 60$

Rasen:



$$(14,63+4,7) \cdot 14,62/2 + 9,85 \cdot 0,5 + (14,48+14,77) \cdot 0,5/2 + 14,62 \cdot 11,91 + (14,62+2,22) \cdot 14,77/2 + 26,77 \cdot 5,46 + 9,43 \cdot 26,77/2 = 141,30+4,9+7,3+174,12+124,36+146,16+126,22 = 724,41 \text{ m}^2 = 21,28 \% \text{ der Fläche vom Umbau betroffen}$$

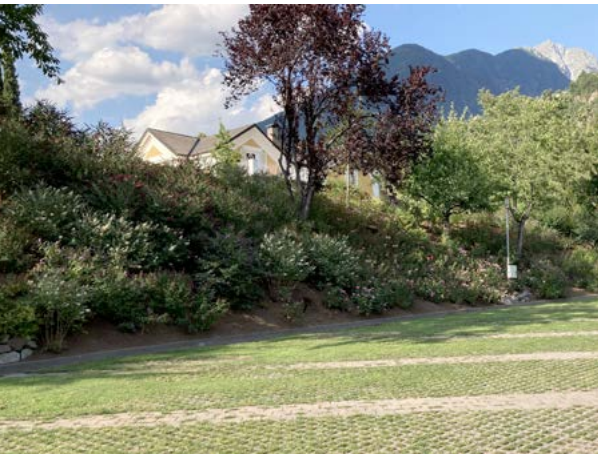
Punkte: $21,28 \cdot 0,75 = 15,96$

Bäume mit $\varnothing > 0,30 \text{ m}$:



Wuchsklasse 1 : n.15 Bäume
Punkte: $15 \cdot 5 = 75$
maximal zulässiger Anteil der einzelner Punkte auf der möglichen öF-Gesamtindex:
 $80 / 5 = 16$

Punkte insgesamt: $60+15,96+16 = 91,96 > 80$



Other examples of measures applied to visitor and accomodation facilities

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